CCS-2 Publications and Other Performance Indicators
March 2005 to March 2006

CCS-2 Peer Reviewed Journal Publications

M.R. Petersen, K. Julien, and J. B. Weiss, "Vortex cores, strain cells, and filaments in quasigeostrophic turbulence" Phys. Fluids 18, 026601 (2006).

S. Elliott, S. Chu, and D. Erickson, "Contours of simulated marine dimethyl sulfide distributions under variation in a Gabric Mechanism, Environmental Modeling & Software", 2005, in press.

S. Elliott, S. Chu, M. Maltrud, and A. McPherson, "Animation of global marine chlorophyll distributions from fine grid biogeochemistry/transport modeling", In: ESEC Volume 2, FiatLux: Chapter 9.

S. Chu, S. Elliott, M. Maltrud, and D. Erickson, "Ecodynamic and eddy admitting simulations of dimethyl sulfide distributions in the Parallel Ocean Program. Earth Interactions", 1-25.

S. Chu, S. Elliott, M. Maltrud, and F. Chai, "Iron patch enrichments in the Southern Ocean of a global eddy permitting general circulation model," ESEC Volume 2, FiatLux: Chapter 8.

S. Belviso, S. Elliott, "Comparison of global climatological maps of sea surface dimethylsulfide. Global Biogeochemical Cycles", et. al., 18: 10.1029/2003GB002193.

S. Elliott, "Marine systems simulation in the Anthropocene", submitted to The Scientific World.

S. Elliott, M. Maltrud, S. Chu, and D. Erickson, "TRACEGAS_MOD: Processing for low concentration volatiles in the Community Climate System Model ocean", submitted to Environmental Modeling & Software.

F. Bryan, M. Hecht and R. Smith., "Resolution Convergence and Sensitivity Studies with North Atlantic circulation Models. Part I: The Western Boundary Current System", submitted to Ocean Modelling, currently in revision.

P. Gent, F. Bryan, G. Danabasoglu, K. Lindsay, D. Tsumune, M. Hecht and S. Doney, "Ocean Chlorofluorocarbon and Heat Uptake During the 20th Century in the CCSM3", in Press, Journal of Climate.

D. Tsumune, F. Bryan, S. Doney and M. Hecht, "Interannual Variability of Chlorofluorocarbons, pCFC Ages and Ideal Ages in the North Pacific from 1958^×2000

as Simulated by an Ocean General Circulation Model", under review at Journal of Geophysical Research.

B.A. Wingate and M.A. Taylor, "Measuring characteristic length scales of prolate spheroidal wave functions in one and two dimensions", submitted: Journal of Engineering Mathematics special issue on Spectral interpolation and Applications (2006).

M.A. Taylor and B.A. Wingate, "Generalized basis functions for Triangles", submitted: Journal of Engineering Mathematics special issue on Spectral interpolation and Applications (2006).

B.A. Wingate and M.A. Taylor, "Performance of Numerically Computed Quadrature Points", submitted: Applied Numerical Mathematics (2005).

S. Kurien, L. Smith and B.A. Wingate, "On the two-point correlation of potential vorticity in rotating and stratified turbulence", To appear: Journal of Fluid Mechanics (2005).

M.A. Taylor, B.A. Wingate, L.P. Bos,"A cardinal function algorithm for computing multivariate quadrature points." To appear: SIAM Journal on Numerical Analysis (2004).

D.D. Holm, C. Jeffery, S. K. Kurien, D. Livescu, M.A. Taylor, and B.A. Wingate, "The LANS-alpha Model for Computing Turbulence: Origins, Results, and Open Problems", LA Science Number 29, pp 152 (2005).

D.D. Holm and B.A. Wingate, "Baroclinic Instabilities of the two-layer quasigeostrophic alpha model", Journal of Physical Oceanography 35 no. 7, pp 1287-1296 (2005).

W. Weijer, and S.T. Gille, "Energetics of wind-driven barotropic variability in the Southern Ocean", 2005, Journal of Marine Research, 63, 1101-1125.

W. Weijer, and S. T. Gille, "Adjustment of the Southern Ocean to wind forcing on synoptic time scales," 2005, Journal of Physical Oceanography, 35, 2076-2089.

W. Weijer, "High-frequency wind forcing of a channel model of the ACC: Normal mode excitation", 2005. Ocean Modelling, 9, 31-50.

H.A. Dijkstra, and W. Weijer, "Stability of the global ocean circulation: basic bifurcation diagrams," 2005, Journal of Physical Oceanography, 35, 933-948.

B.T. Nadiga, "On the dynamics of alternating zonal jets in oceans," (2006), Geophysical Research Abstracts, Vol. 8, 05201.

B.T. Nadiga, "Oceanic Zonal Jets and the Barotropic Vorticity Equation," (2006), Eos Trans. AGU, 87(36), Ocean Sci. Meet. Suppl., Abstract OS45L-04.

B.T. Nadiga, "On zonal jets in oceans," (2006), Geophysical Research Letters (submitted).

B.T. Nadiga, M.A. Taylor, J. Lorenz, "Implicit time stepping for OGCMs", (2006), Computer and Mathematical Modeling (to appear).

J. Duan and B.T. Nadiga, "Stochastic parameterization for large eddy simulation of geophysical flow," (2006), Proceedings of the Americal Mathematical Society (to appear).

M. Hecht, "Forward-in-time Upwind-Weighted Methods in Ocean Modeling," *International Journal for Numerical Methods in Fluids,* final version available on-line at doi 10.1002/fld.1136.

F. Bryan, M. Hecht and R. Smith, "Resolution Convergence and Sensitivity Studies with North Atlantic circulation Models. Part I: The Western Boundary Current System," submitted to Ocean Modelling, currently in revision.

P. Gent, F. Bryan, G. Danabasoglu, K. Lindsay, D. Tsumune, M.Hecht and S. Doney. "Ocean Chlorofluorocarbon and Heat Uptake During the 20th Century in the CCSM3", In Press, Journal of Climate.

D. Tsumune, F. Bryan, S. Doney and M. Hecht, "Interannual Variability of Chlorofluorocarbons, pCFC Ages and Ideal Ages in the North Pacific from 1958—2000 as Simulated by an Ocean General Circulation Model," Under review at Journal of Geophysical Research.

N.T.Padial-Collins, D.Z.Zhang, Q.Zou, X.Ma, and W.B.VanderHeyden, "Centrifugal Contactors: Separation of an aqueous and an organic stram in the rotor zone" to be published in "Separation Science and Technology, vol. 41, no.6."

J.G. Wohlbier, "Phase distortion mechanisms in linear beam vacuum devices," IEEE Trans. Plasma Sci., Vol. 33, no. 3, 2005.

J.G. Wohlbier, S. Jin, and S. Sengelem, "Eulerian calculations of wave breaking and multi-valued solutions in a traveling wave tube", Physics of Plasmas 12, 023106 (2005).

J.G. Wohlbier and J.H. Booske, "Nonlinear space charge wave theory of distortion in a klystron," IEEE Trans. Electron Devices, Vol. 52, no. 5, 2005.

A. Singh, J.E. Scharer, J.H. Booske, and J.G. Wohlbier, "Second and third-order signal injection for nonlinear distortion suppression in a traveling wave tube," IEEE Trans. Electron Devices, Vol. 52, no. 5, 2005.

A. Brydon, S.G. Bardenhagen, E.A. Miller, G.T. Seidler, “Simulation of the densification of real open-celled foam microstructures,” Journal of the Mechanics and Physics of Solids; Dec. 2005; vol.53, no.12, p.2638-60.

S.G. Bardenhagen, A.D. Brydon, J.E. Guilkey, “Insight into the physics of foam densification via numerical simulation,” Journal of the Mechanics and Physics of Solids; March 2005; v.53, no.3, p.597-617.

G. Metcalfe, M. Rudman, A. Brydon, L.J.W. Graham, R. Hamilton, “Composing chaos: An experimental and numerical study of an open duct mixing flow,” AICHE JOURNAL; JAN 2006; v.52, no.1, pp. 9-28.

R. Loubere, E. Caramana, “The Force/Work Differencing of Exceptional Points in the Discrete, Compatible Formulation of Lagrangian Hydrodynamics," LA-UR-04-8906, accepted for publication, Journal of Computational Physics in Nov. 05.

E. Caramana, R. Loubere, “Curl-q: A Vorticity Damping Artificial Viscosity for Lagrangian Hydrodynamics Calculations,” LAUR-05-6618, accepted for publication, Journal of Computational Physics in Nov. 05.

D. Livescu “Reply to Response to “Comment on ‘Compressible Rayleigh-Taylor Instabilities in Supernova Remnants” [Phys. of Fluids 16, 4661, (2004)],” to appear in Physics of Fluids 16(8), 069101-069102, 2005.

D. Livescu “Comment on ‘Compressible Rayleigh-Taylor Instabilities in Supernova Remnants’ [Phys. of Fluids 16, 4661, (2004)],” Physics of Fluids 16(6), 069101-069102, 2005.

D.D. Holm, C. Jeffery, S. Kurien, D. Livescu, M.A. Taylor, and B.A. Wingate, “The LANS-a Model for Computing Turbulence: Origins, Results, and Open Problems,” Los Alamos Science 29, 152-171, 2005.

J. Glimm, J.W. Grove, Y. Kang, T. Lee, X. Li, D.H. Sharp, Y. Yu, K. Ye, M. Zhao, "Errors in Numerical Solutions of Spherically Symmetric Shock Physics Problems," Contemporary Mathematics, Vol. 371, 163-179, LA-UR-04-0713, 2005.

Y. Zhang, P. Drake, J. Glimm, J. Grove, D.H.J. Sharp, "Radiation Coupled Front Tracking Simulations for Laser Driven Shock Experiments", Nonlinear Analysis, In press. LANL report No. LA-UR-04-2381.

E.J. Caramana, M.M. Francois, R. Loubere, "The Slide Line Model in the Compatible Formulation of Lagrangian Hydrodynamics," submitted to Journal of Computational Physics, LA-UR-05-9150.

M.M. Francois, S.J. Cummins, E.D. Dendy, D.B. Kothe, J.M. Sicilian, M.W. Williams, "A Balanced-Force Algorithm for Continuous and Sharp Interfacial Surface Tension

Models within a Volume Tracking Framework," , Journal of Computational Physics, Vol. 213, pp. 141-173, 2006.

CCS-2 Classified & Unclassified Reports

Unclassified Reports

D.A. Korzekwa, N.N. Carson, K. Lam, J.M. Sicilian, B.W. Smith, "Truchas Simulation of the Qual 126 Type Pit (U)", LA-CP-05-1224.

M.R. Petersen, B. Kraus, and T. Windham: 2005, "Striving towards equity; Underrepresented minorities and mathematics Part I", SIAM News, March.

M.R. Petersen, B. Kraus, and T. Windham: 2005, "Striving towards equity; Underrepresented minorities and mathematics Part II", SIAM News, April.

D. Erickson, S. Elliott, and 13 others, 2005. "A coupled biogeochemistry-physical climate simulation within the CCSM3 infrastructure", Annual report of the SciDAC Biogeochemistry Climate Modeling team to DOE OBER.

R. Bleck, M. Maltrud, S. Chu, F. Chai, F. Chavez, and S. Elliott, 2004. "Comparison of Cartesian and isopycnal simulations of oceanic carbon sequestration via iron fertilization and deep injection," University of Miami web page.

M. A. Taylor, B. A. Wingate, and L. P. Bos, "Several new quadrature formulas for polynomial integration in the triangle", arXiv:math.NA/0501496, 2005.

P. Ramaprabhu, G. Dimonte, and M.J. Andrews, “The Effect of Initial Conditions on the Rayleigh-Taylor Flow,” Research Highlights, Theoretical Division, Los Alamos National Laboratory, LA-UR-05, April, 2005.

J.R. Ristorcelli, D. Livescu, and Hjelm, “An eddy viscosity hypothesis for Favre averaged Reynolds stresses in variable density turbulence,” Los Alamos National Laboratory Report LA-UR-05-5837.

R.B. Lowrie, “The HLLL Flux Function for Real Materials,” October 2005, CCS-2-05-XX, Hydrodynamics and Marmot Project Memo.

R.B. Lowrie, E.D. Dendy, P.J. Henning, M.A. Christon, “Vision and Scope for Phase I of the Otter Project,” CCS-2-05-16, Hydrodynamics and Marmot Project Memo.

R.B. Lowrie, “Mesh Symmetries and Conservative Difference Schemes,” CCS-2:05-XX, December 2005, Hydrodynamics and Marmot Project Memo.

Grove, J. W., "Manual for Amhctools code package", LA-UR-05-7424, 2005.

M.L. Hall and A.B. Davis, "Progress Towards Higher-Fidelity Yet Efficient Modeling of Radiation Energy Transport Through Three-Dimensional Clouds", presentation to the Atmospheric Radiation Measurement (ARM) Science Team Meeting in Daytona Beach, FL (3/2005). LA-UR-05-2275.

W. Joubert, M.L. Hall, J. Cullum, and B. Lally, "The LAMG Solver Library: Recent Results and Future Plans," presentation at LANL. LA-UR-05-1345.

A.B. Davis, M.L. Hall and I.N. Polonsky, "Three-Dimensional Radiative Transfer, Simplified ... with Cloud Modeling and Remote Sensing in Mind," presentation to the Atmospheric Radiation Measurement (ARM) Science Team Meeting in Daytona Beach, FL (3/2005). LA-UR-05-2282.

M.L. Hall and A.B. Davis, "Progress Towards Higher-Fidelity Yet Efficient Modeling of Radiation Energy Transport Through Three-Dimensional Clouds," extended abstract for the Atmospheric Radiation Measurement (ARM) Science Team Meeting in Daytona Beach, FL (3/2005). LA-UR-05-6296.

M.L. Hall and A.B. Davis, "Higher-Fidelity Yet Efficient Modeling of Radiation Energy Transport Through Three-Dimensional Clouds", poster presentation for the CCS Division Review Committee (6/2005). LA-UR-05-6295.

A.B. Davis, M.L. Hall, and I.N. Polonsky [along with collaborators G. Bal (Columbia Univ.), Y. Kogan (U. of Oklahoma), W. O'Hirok "3D Radiative Fluxes for the Local Energy Budget in Cloud-System Resolving Models, and 3D Radiances Enabling their Performance Assessment with ARM and MTI Data", (UCSB), and Steven Krueger (U. of Utah)], proposal to the U.S. Department of Energy's Atmospheric Radiation Measurement (ARM) Program. LA-UR-05-6297.

CCS-2 Participation on Review and Advisory Committees

M. Andrews, CCS-2: ASME Computational Heat Transfer Committee, K20.

M. Andrews, CCS-2: ASME Multiphase Flow Committee, K8.

M. Andrews, CCS-2: LANL Fellow review committee.

M. Andrews, CCS-2: Chairman, TAMU Steering Committee for the TX-UK Collaborative Initiative.

M. Andrews, CCS-2: Member TAMU Council of Principal Investigators.

M. Andrews, CCS-2: Member of Deans Life Science Advisory Group.

CCS-2 Professional Society Officer and Program Committee Memberships

J. Sicilian, "LANL / UNM Materials Solidification Modeling Workshop," Organizer and Session Chairman, April 28-20, 2005.

M.Hecht, "Eddy-Resolving Ocean Modeling", Ocean Sciences 2006.

M. Andrews, Session Chairman, FE-11-2: Symposium on Flows in Manufacturing Processes II, 2005 ASME Fluids Engineering Summer Conference, Houston, Texas, USA, June 19-23, 2005.

M. Andrews, Session Co-Chairman, HT-11C: Multiphase Heat/Mass Transfer & Melting/Solidification in Manufacturing and Material Processing, 2005 ASME International Mechanical Engineering Congress & Exposition, Walt Disney World Swan & Dolphin Hotels, Orlando, Florida, USA, November 5-11,2005.

M. Andrews, Session Chairman, MFGT-6: Multiphase Heat-Mass Transfer & Melting-Solidification in Manufacturing and Material Processing, 2005 ASME International Mechanical Engineering Congress & Exposition, Walt Disney World Swan & Dolphin Hotels, Orlando, Florida, USA, November 5-11, 2005.

M. Andrews, Session Chairman, „FED10A: Experimental Investigations of Multiphase Flow, 2005 ASME International Mechanical Engineering Congress & Exposition, Walt Disney World Swan & Dolphin Hotels, Orlando, Florida, USA, November 5-11, 2005.

M. Andrews, Session Co-Chairman, „FED11B: Numerical Simulations and Theoretical Developments for Multiphase Flows I, 2005 ASME International Mechanical Engineering Congress & Exposition, Walt Disney World Swan & Dolphin Hotels, Orlando, Florida, USA, November 5-11, 2005.

M. Andrews, Session Co-Chairman, FED13D: Numerical Simulations and Theoretical Developments for Multiphase Flows II, 2005 ASME International Mechanical Engineering Congress & Exposition, Walt Disney World Swan & Dolphin Hotels, Orlando, Florida, USA, November 5-11, 2005.

M. Andrews, Session Co-Chairman, „FED15C: General Papers I: Turbulence, 2005 ASME International Mechanical Engineering Congress & Exposition, Walt Disney World Swan & Dolphin Hotels, Orlando, Florida, USA, November 5-11, 2005.

M. Andrews, Session Chairman, FED16C: General Papers II: Novel Fluid Systems, 2005 ASME International Mechanical Engineering Congress & Exposition, Walt Disney World Swan & Dolphin Hotels, Orlando, Florida, USA, November 5-11, 2005.

M. Andrews, Session Chairman, FED16D: General Papers III: Applications, 2005 ASME International Mechanical Engineering Congress & Exposition, Walt Disney World Swan & Dolphin Hotels, Orlando, Florida, USA, November 5-11, 2005.

M. Andrews, Session Chairman, FED17D: General Papers IV: Numerical, 2005 ASME International Mechanical Engineering Congress & Exposition, Walt Disney World Swan & Dolphin Hotels, Orlando, Florida, USA, November 5-11, 2005.

M. Andrews, Topic Organizer, General Papers, 2005 ASME International Mechanical Engineering Congress & Exposition, , Walt Disney World Swan & Dolphin Hotels, Orlando, Florida, USA, November 5-11, 2005. Twenty five (25) papers, forty abstracts (40).

M. Andrews, KCR for ASME K-20 (Computational Heat Transfer) Committee, for 2005 ASME International Mechanical Engineering Congress & Exposition, Walt Disney World Swan & Dolphin Hotels, Orlando, Florida, USA, November 5-11, 2005. Elected. (Thirty eight (38) papers, forty six (46) abstracts.

CCS-2 Professional Honors, Awards, and Election to National Scientific and Engineering Societies

M. Andrews, National Security Fellow, Texas Engineering Experiment Station (TEES) Fellow.

CCS-2 Adjunct Appointments by School (currently active appointments)

D. Holm, CCS-2 Imperial College, London, joint appointment, ongoing.